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exit of the larvæ these two openings run together to form one. To what part of genital apparatus of other insects does this double incubation sac correspond? I have not yet been able to settle this point, in as much as I have only had under observation insects in which the sacs were already filled with eggs in course of development, and in which the empty and shrivelled ovaries were with difficulty visible. In spite of the relatively long duration of their life, the *Chlœopses* takes no more food in the adult state than the other *Ephemæræ*. Their mouth is only armed with a few soft and incomplete parts.

"The larvæ are elongated, very active, armed with feet terminated by a single hook. The head, roughly pentagonal in form, bears two long antennæ and five ocular spots of which one, odd, is situated between the bases of the antennæ; the four others are arranged in two pairs, of which the posterior furnishes the reticulated eyes of the adult. The mouth is provided with a masticatory apparatus, which is well formed. The abdomen is formed of ten segments, of which the last bears two long filaments provided with a few stiff hairs. The length of the body is 0.7 millim., not including the caudal filaments, which are at least as long as the body. The cephalo thorax and the anterior part of the abdomen contain at birth brilliant globules, which disappear in a day or two. During the first period of their existence the larvæ have neither tracheæ nor tracheal branchiæ. Six days after their birth the larvæ undergo a first change; their appearance changes but little, but on each of the 2nd, 3rd, 4th, 5th and 6th abdominal rings there appears a pair of short prominences, each as much developed as the others, the rudiments of the future tracheo-branchiæ. Three days later there is another change; the five prominences just mentioned become elongated, and a pair of them appear on the first abdominal ring, the tracheæ also become visible. After the third change, the five pairs of tracheo-branchiæ are well formed and receive the tracheæ. Those of the first ring do not develop completely until the fourth change, and, finally, those of the seventh abdominal ring, apparent at the third change, are not complete till after the fifth. From that time the larva possesses all its organs."

EMBRYOLOGY.¹

The Corpus Luteum.—The fate of the Graafian follicle of the Mammal's ovary is certainly very remarkable. The well known corpus

¹ Edited by E. A. Andrews, Baltimore, Md., to whom abstracts reviews and preliminary notes may be sent.

luteum that results from the rupture of the follicle is generally thought to be a growth of connective tissue, for the most part. J. Sobotta,² however, finds that in the mouse this structure is formed by the enlargement of the epithelial cells of the follicle, aided by growth of connective tissue. His results are obtained from the very large number of sections used in his previous study of the fertilization and cleavage of the mouse's egg (See AMERICAN NATURALIST Aug. '95) and from the thousands of specimens at his disposal he is able to write a complete history of the corpus luteum.

It is interesting to note that in three cases in which the egg was abnormally retained in follicles that had ruptured as usual when ripe the usual corpora lutea were formed, though of course the egg had not been fertilized. This and other reasons lead the author to affirm that, in the mouse, no distinction can be drawn between corpora lutea vera and corpora lutea spuria, that is to say the yellow body is just the same whether the egg is fertilized or not.

The chief results of this paper may be summarized as follows:

In the ripe Graafian follicle of the mouse the connective tissue sheath is composed of a fibrous outer part and of an inner coat of large, rounded cells; the many-layered epithelium internal to the latter shows mitotic divisions; at the centre is the usual liquid bathing the discus proligerous that envelopes the egg. Both the connective tissue and the epithelial layers are much thinned away on the side next the body-cavity where the rupture is to take place.

When the follicle bursts it happens only exceptionally that blood escapes into its central cavity. The ruptured follicle is at first just like the ripe one except for the loss of the egg, discus proligerous, and the chief part of the liquid. The cleft in its side is very quickly healed over by the union of its epithelial edges.

About an hour after the rupture of the follicle the cells of the inner connective tissue sheath begin to divide by mitosis and liquid is secreted into the central cavity. Migratory corpuscles appear in the inner connective tissue sheath.

In from five to seven hours the growth of this sheath gives rise to fine radiating partition that penetrate the epithelial layers. The inner sheath is used up in the growth of these partitions as they extend in through the epithelium to the central space; leucocytes are found all through the epithelial layers.

After forty to fifty hours the liquid accumulated in the central space has been reabsorbed and its place taken by a small, gelatinous connec-

² Archiv. f. Mik. Anat. 47, April, 1896, pp. 261-306.

tive tissue mass; about this the epithelial cells are subdivided by a network formed from the radiating partitions and the leucocytes; the epithelial cells in the meshes of this network are much enlarged but not increased in number, division having ceased at the time of rupture.

The yellow body is complete in from sixty to seventy-two hours. It is then much larger than the original Graafian follicle, as the epithelial cells are swollen to ten times their former size and are intertwined with the newly formed connective tissue bearing a rich network of capillaries. Later more or less fat is deposited in the epithelial cells and the body has a slightly yellow color, but here, as in some other mammals, the name is misleading.

As far as the author's observations go the corpora lutea do not degenerate, in the mouse, but remain unchanged during the life of the animal and thus add much to the size of the ovary.

Cleavage in Ovarian Eggs.—Professor J. Janosik³ finds in some follicles that atrophy in the rabbit and guinea-pig ovarian eggs may undergo a real cleavage, though of course there has been no fertilization (as far as known). Such ovarian eggs may form small cells very like polar bodies and lying near a true spindle which is in the position of a maturation spindle. This is more common in young than in old animals.

There are cases of true cleavage with few to many nucleated cells and these cells may be of equal size or some large and some small. There are also cases of "fragmentation" where the isolated masses of protoplasm contain no visible nucleus. In these cases of ovarian cleavage the membrana pellucida disappears as it does in the normal cleavage. Such eggs later atrophy with their follicles.

PSYCHOLOGY.¹

Annual Meeting of the American Psychological Association.—The Fifth Annual Meeting of the American Psychological Association was held at Boston and Cambridge, on December 29 and 30, 1896. The step taken a year ago of affiliating with the American Society of Naturalists proved so successful that this course has been adopted permanently by the Association. At the present meeting

³ Archiv. f. Mik. Anat., 48. Nov. 7, 1896, pps. 169-181.

¹ Edited by H. C. Warren, Princeton University, Princeton, N. J.